

# Math 240 - Quiz 12

May 4, 2023

Name \_\_\_\_\_

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary. This quiz is due May 9.

---

1. (10 points) Let  $f(x)$  be the periodic extension (with period 2) of its portion defined on  $[0, 2)$  as shown below.

$$f(x) = \begin{cases} 0, & 0 \leq x < 1 \\ 1, & 1 \leq x < 2 \end{cases}$$

- (a) Roughly sketch the graph of 3 or 4 periods of  $f$ .

- (b) Determine the Fourier series for  $f$ .

- (c) Explain the difference between the Fourier series, the Fourier sine series, and the Fourier cosine series for  $f$ . (You don't need to compute them. Just explain.)